FIG. 1A

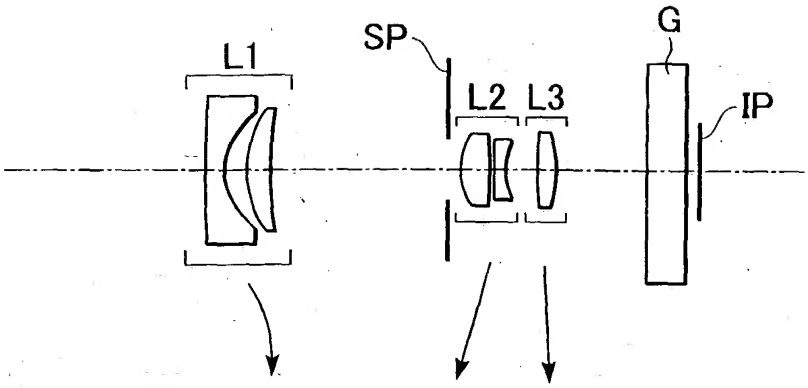


FIG. 1B

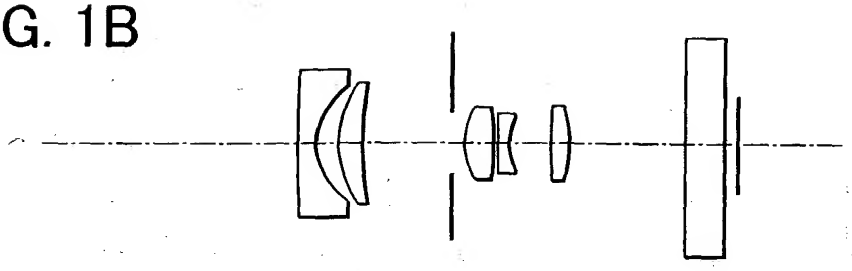


FIG. 1C

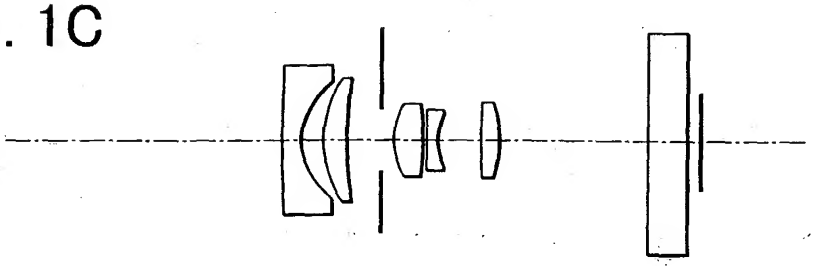


FIG. 2

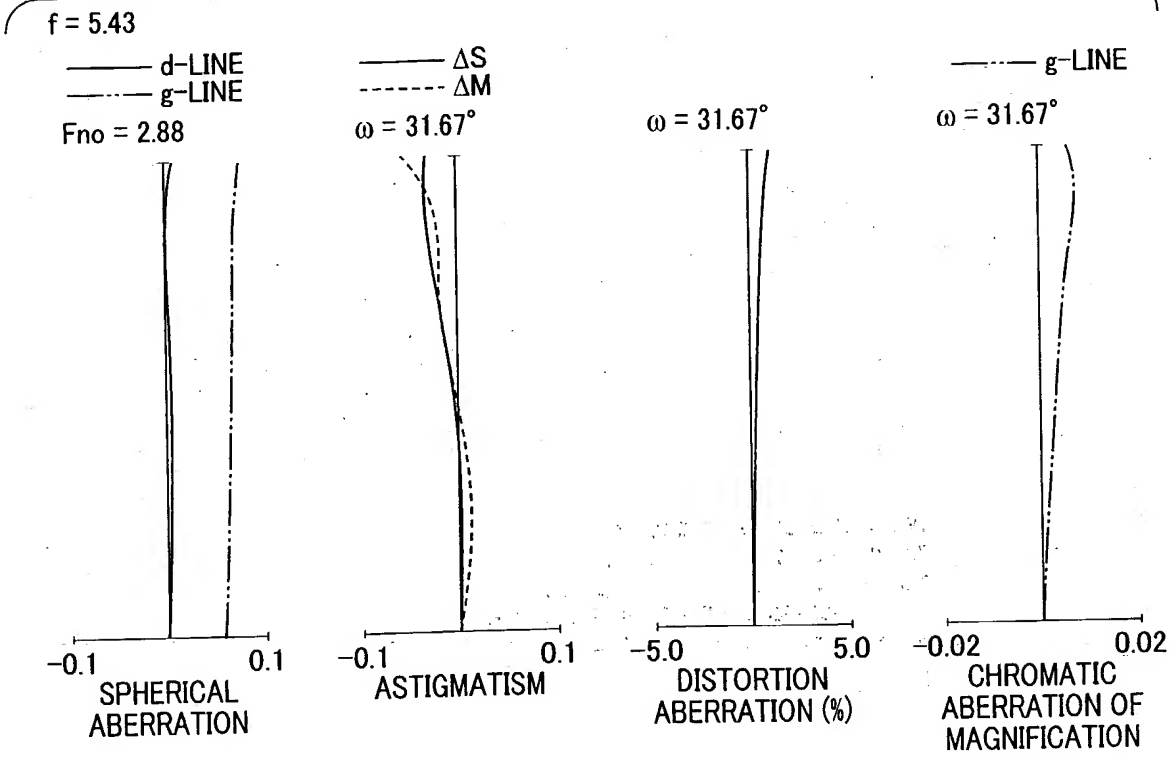

f = 5.43
d-LINE
g-LINE
Fno = 2.88
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 31.67°
−0.1
0.1
ASTIGMATISM
ω = 31.67°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 31.67°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 3

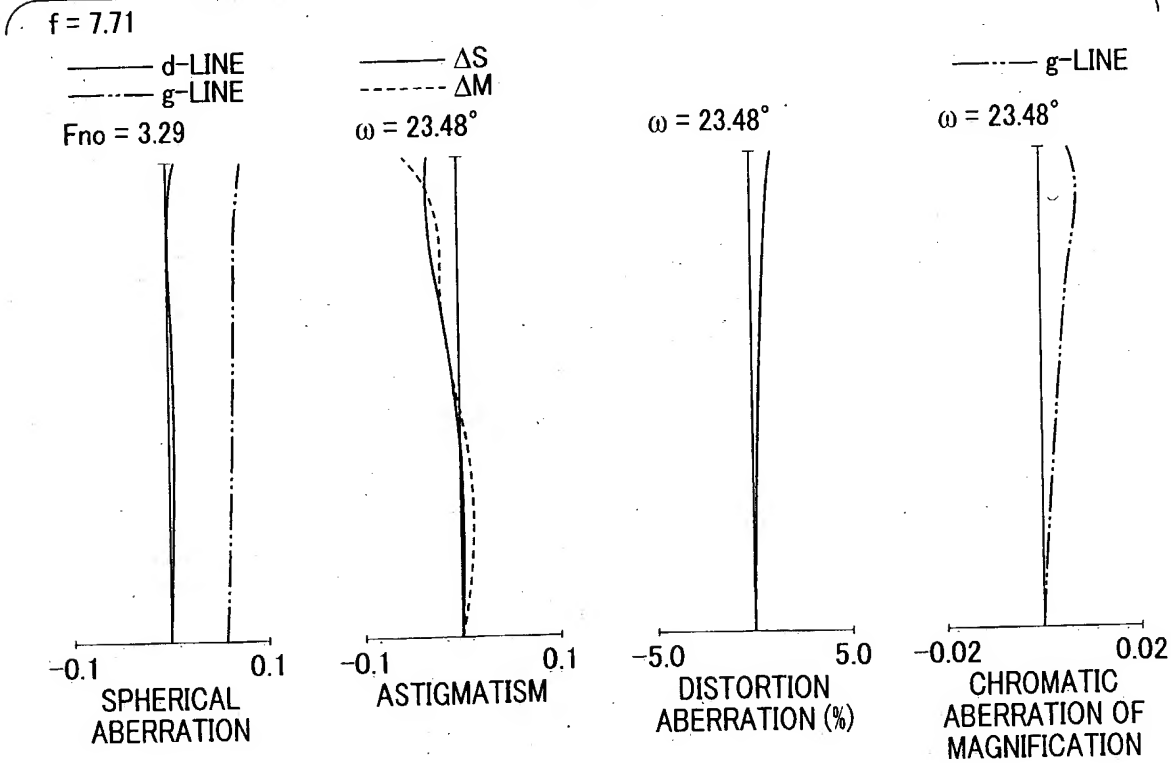

f = 7.71
d-LINE
g-LINE
Fno = 3.29
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 23.48°
−0.1
0.1
ASTIGMATISM
ω = 23.48°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 23.48°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 4

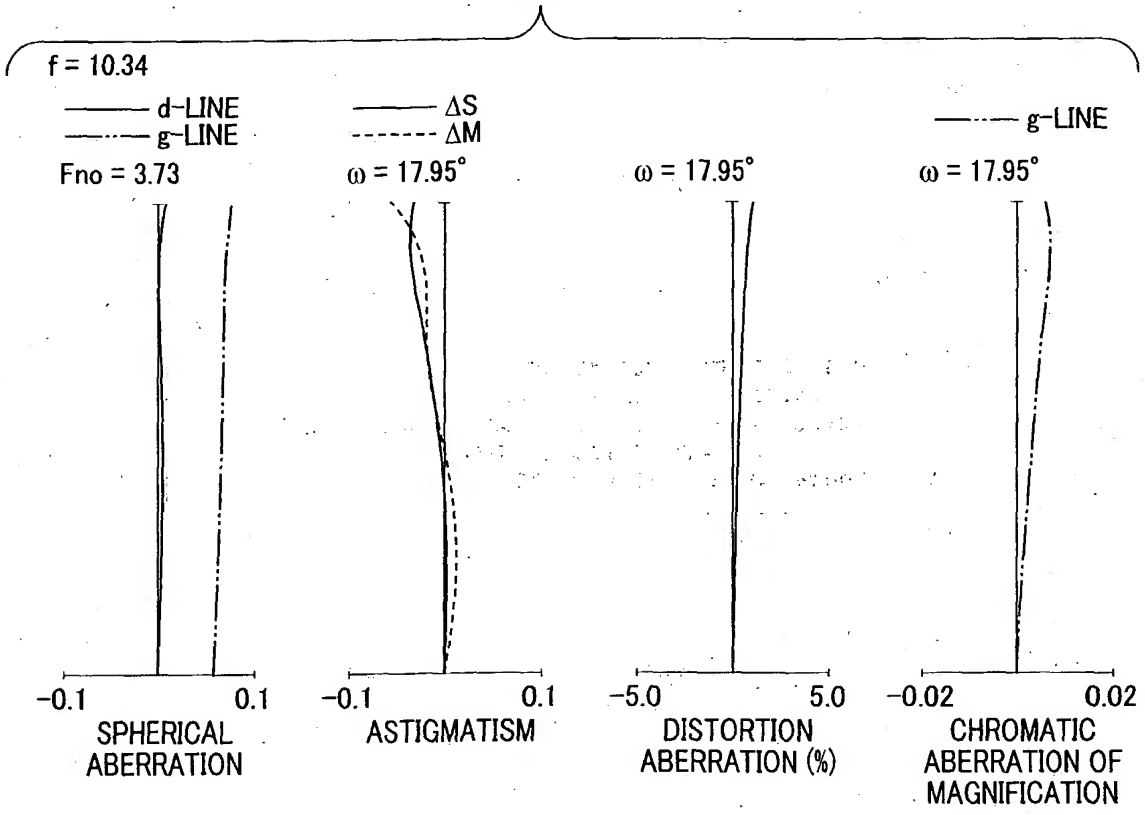

f = 10.34
d-LINE
g-LINE
Fno = 3.73
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 17.95°
−0.1
0.1
ASTIGMATISM
ω = 17.95°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 17.95°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 5A

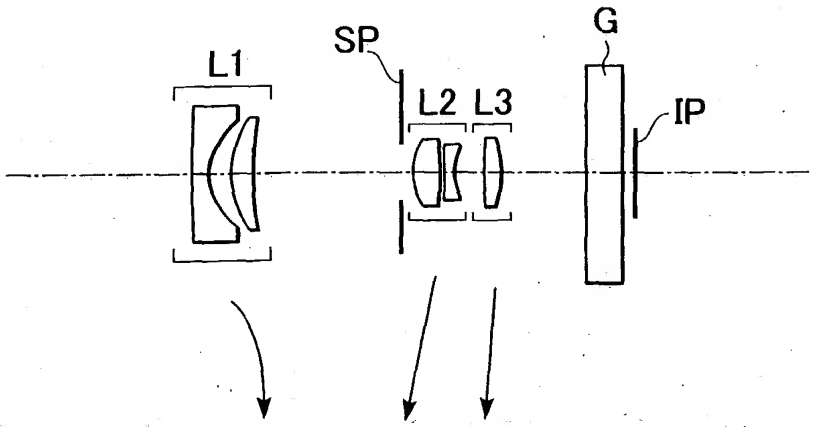


FIG. 5B

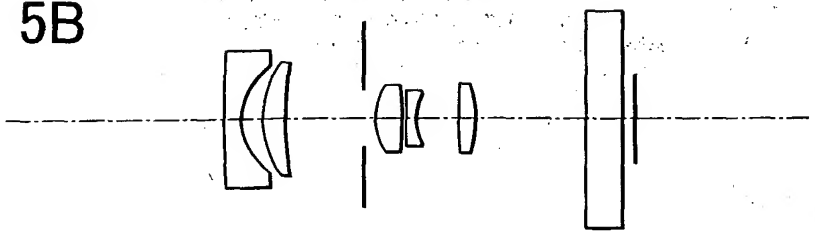


FIG. 5C

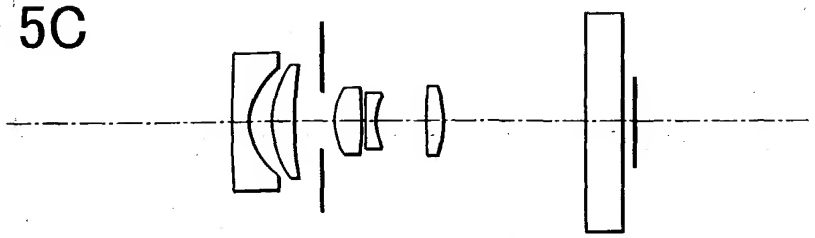


FIG. 6

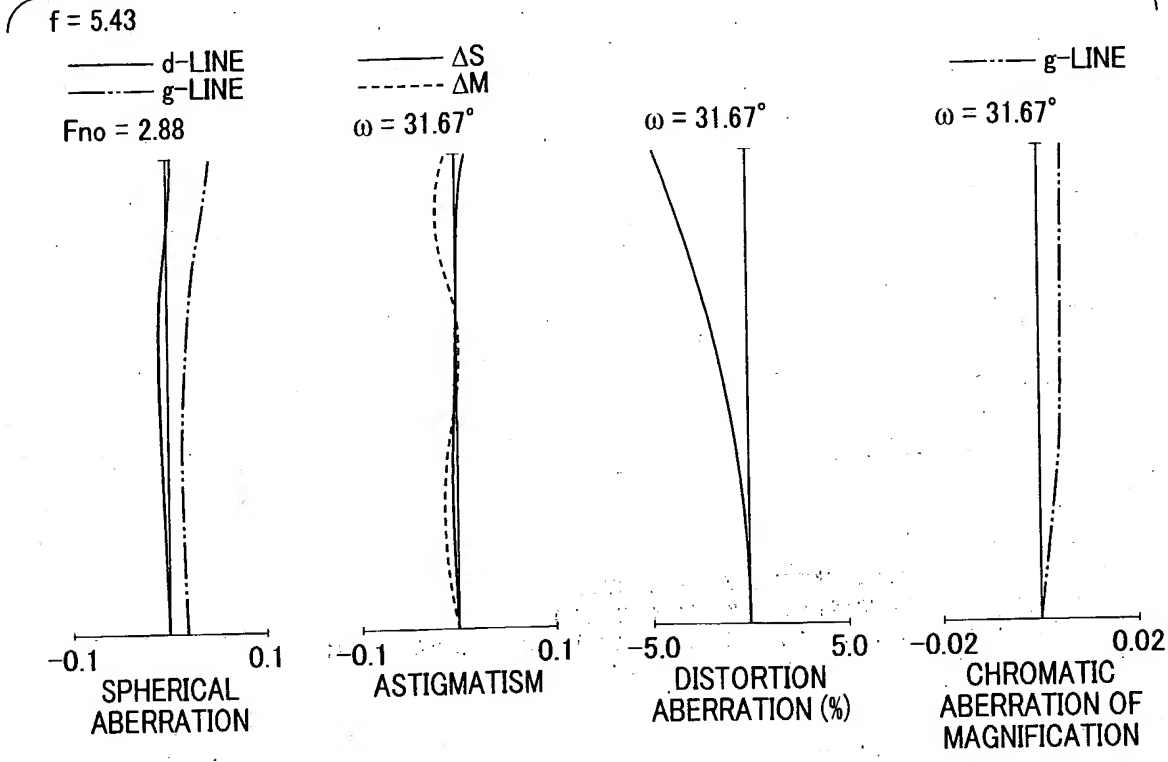

f = 5.43
d-LINE
g-LINE
Fno = 2.88
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 31.67°
−0.1
0.1
ASTIGMATISM
ω = 31.67°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 31.67°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 7

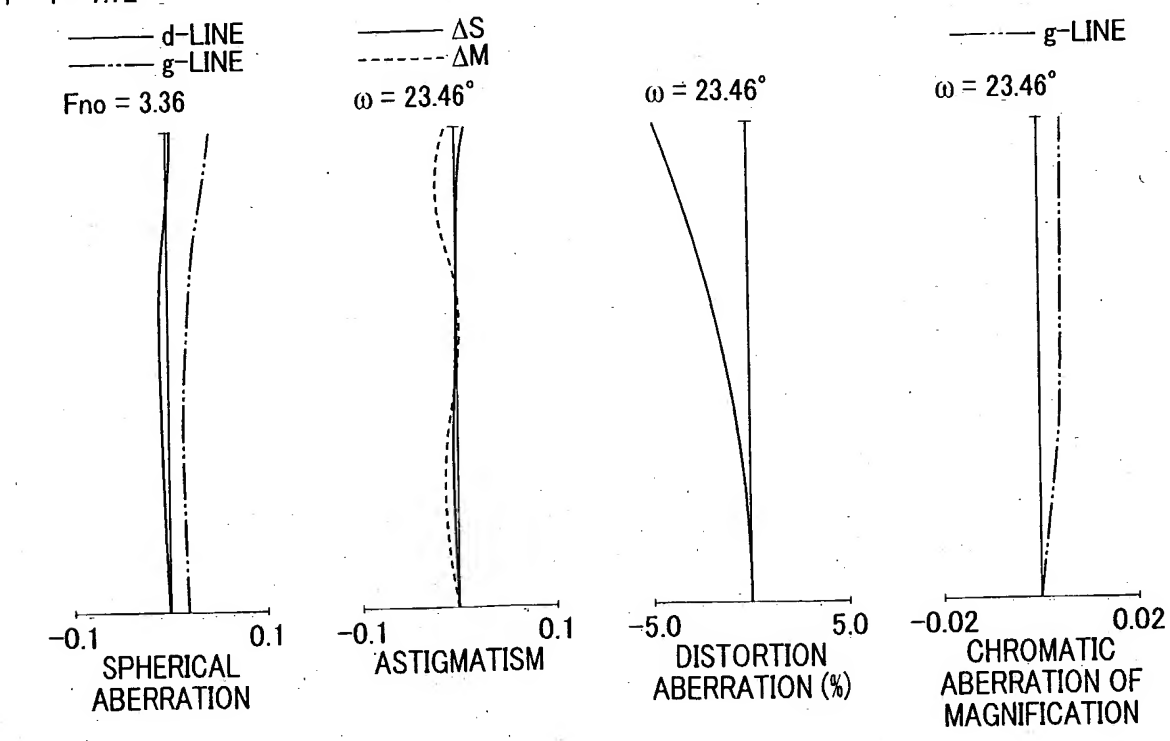

f = 7.72
d-LINE
g-LINE
Fno = 3.36
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 23.46°
−0.1
0.1
ASTIGMATISM
ω = 23.46°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 23.46°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 8

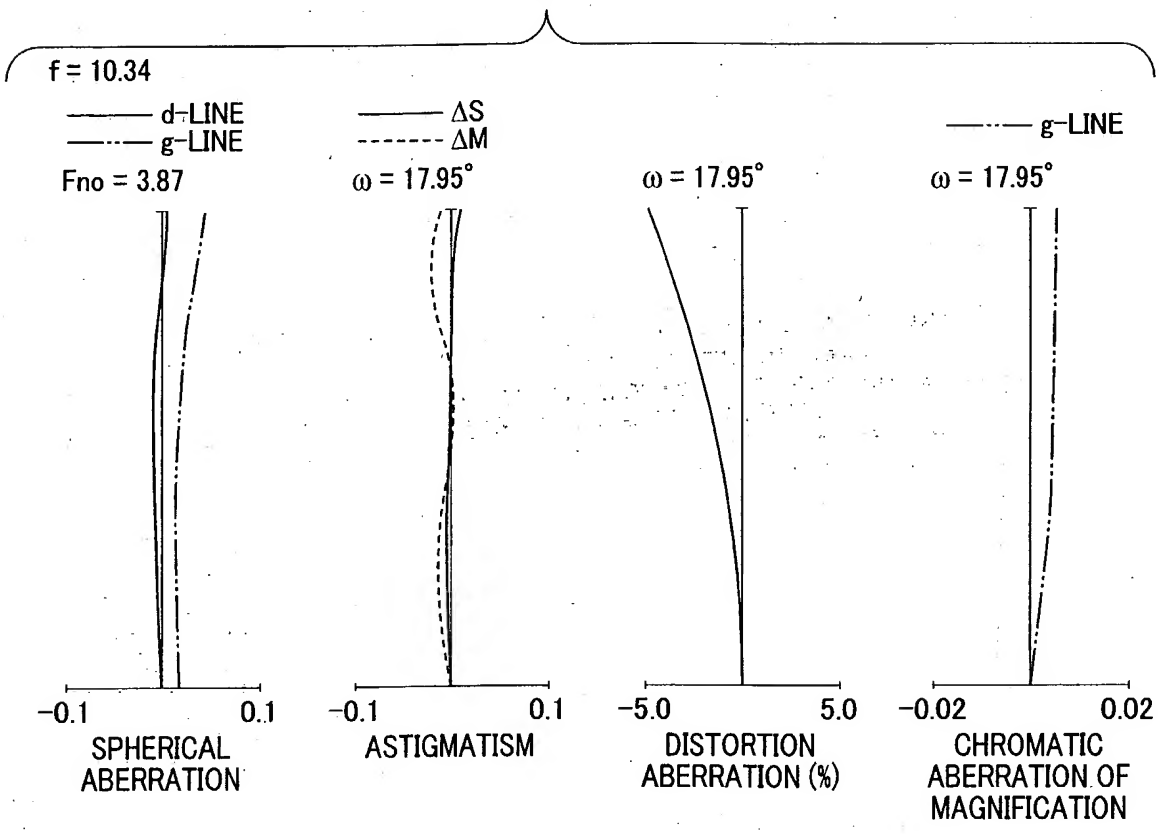

f = 10.34
d-LINE
g-LINE
Fno = 3.87
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 17.95°
−0.1
0.1
ASTIGMATISM
ω = 17.95°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 17.95°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 9A

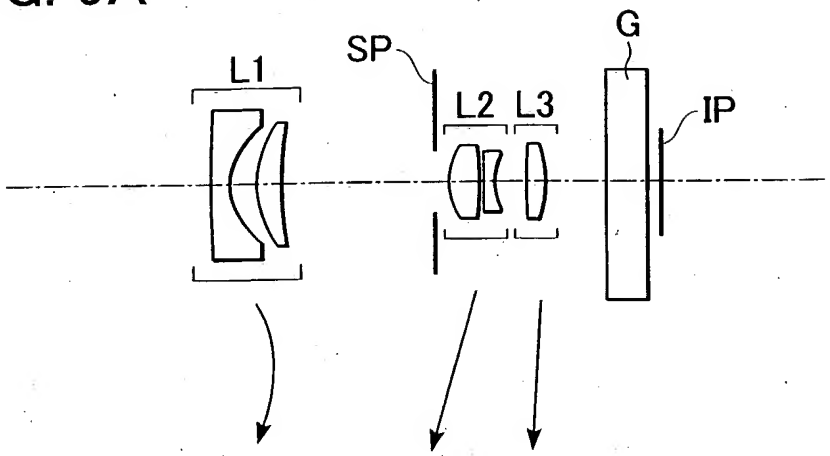


FIG. 9B

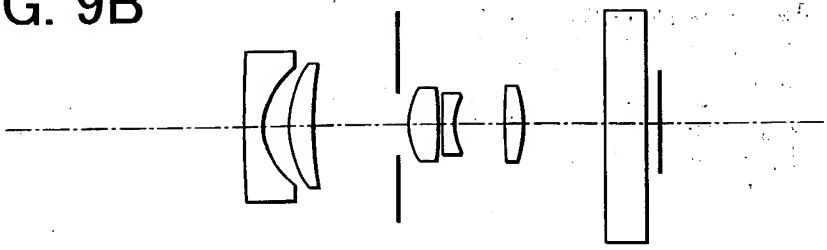


FIG. 9C

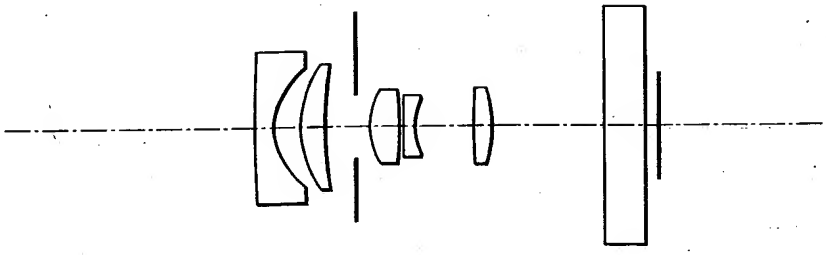


FIG. 10

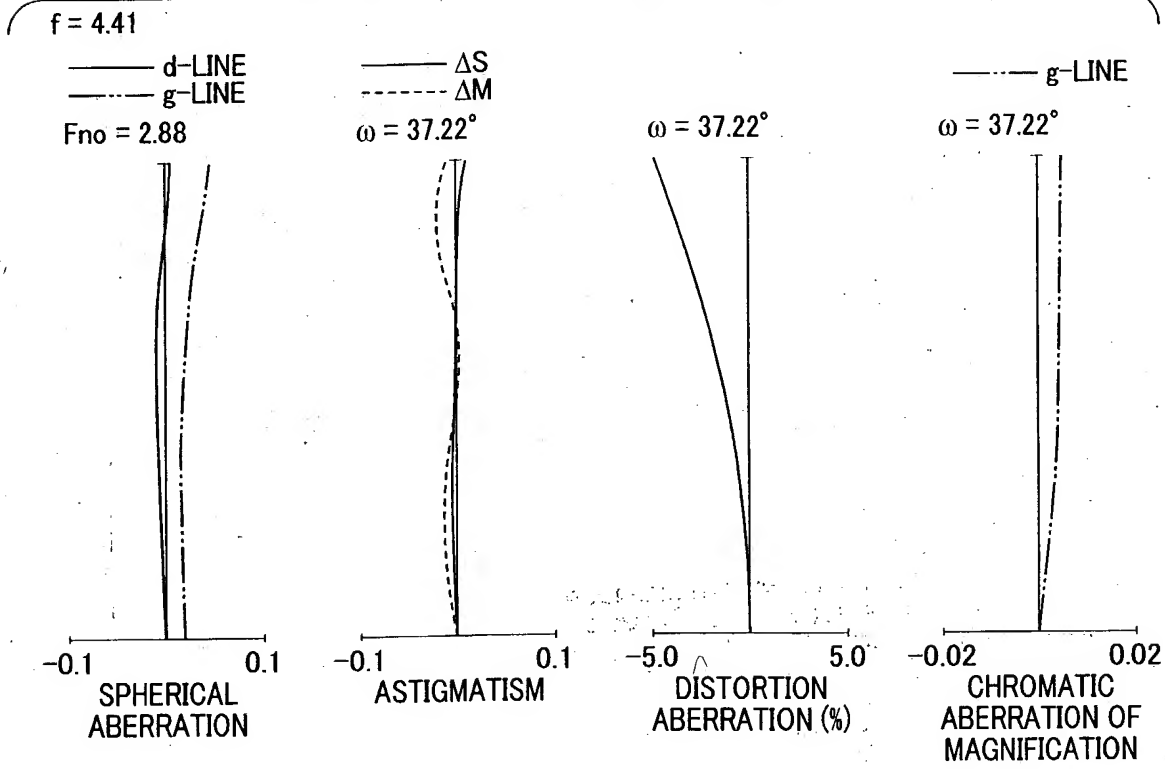

f = 4.41
d-LINE
g-LINE
Fno = 2.88
ΔS
ΔM
ω = 37.22°
ω = 37.22°
g-LINE
ω = 37.22°
−0.1
0.1
SPHERICAL ABERRATION
−0.1
0.1
ASTIGMATISM
−5.0
5.0
DISTORTION ABERRATION (%)
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 11

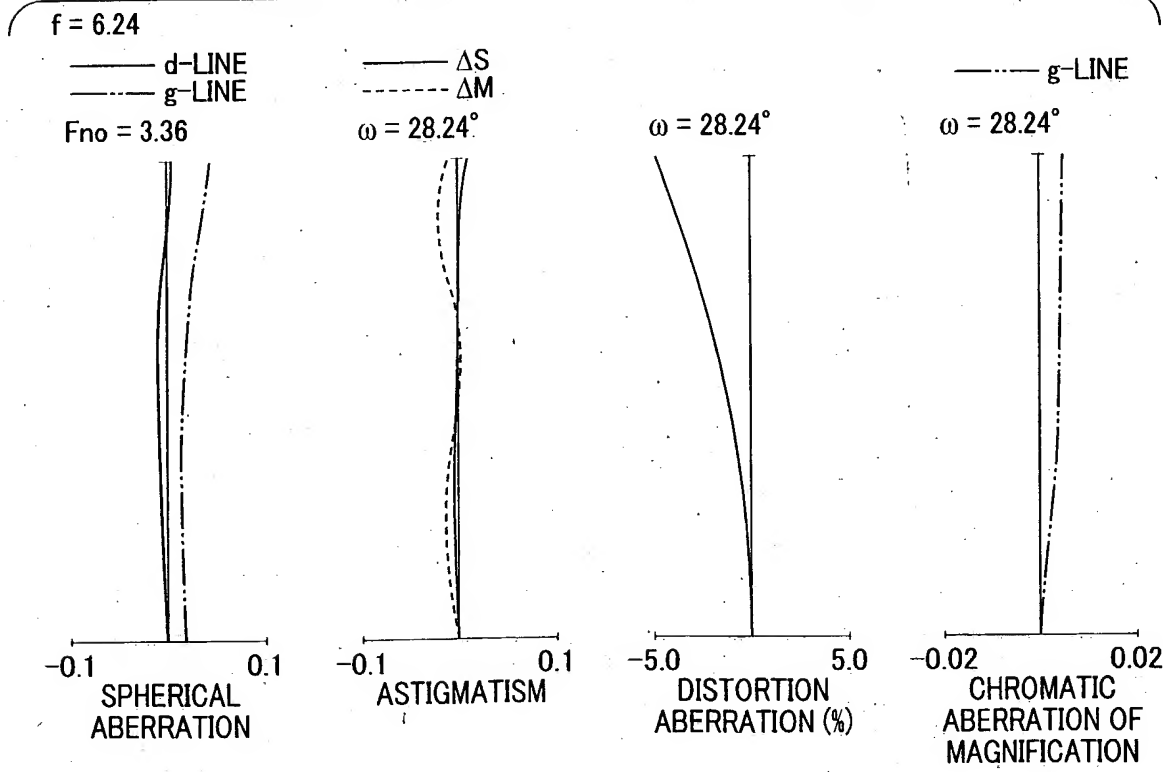

f = 6.24
d-LINE
g-LINE
Fno = 3.36
ΔS
ΔM
ω = 28.24°
ω = 28.24°
g-LINE
ω = 28.24°
−0.1
0.1
SPHERICAL ABERRATION
−0.1
0.1
ASTIGMATISM
−5.0
5.0
DISTORTION ABERRATION (%)
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 12

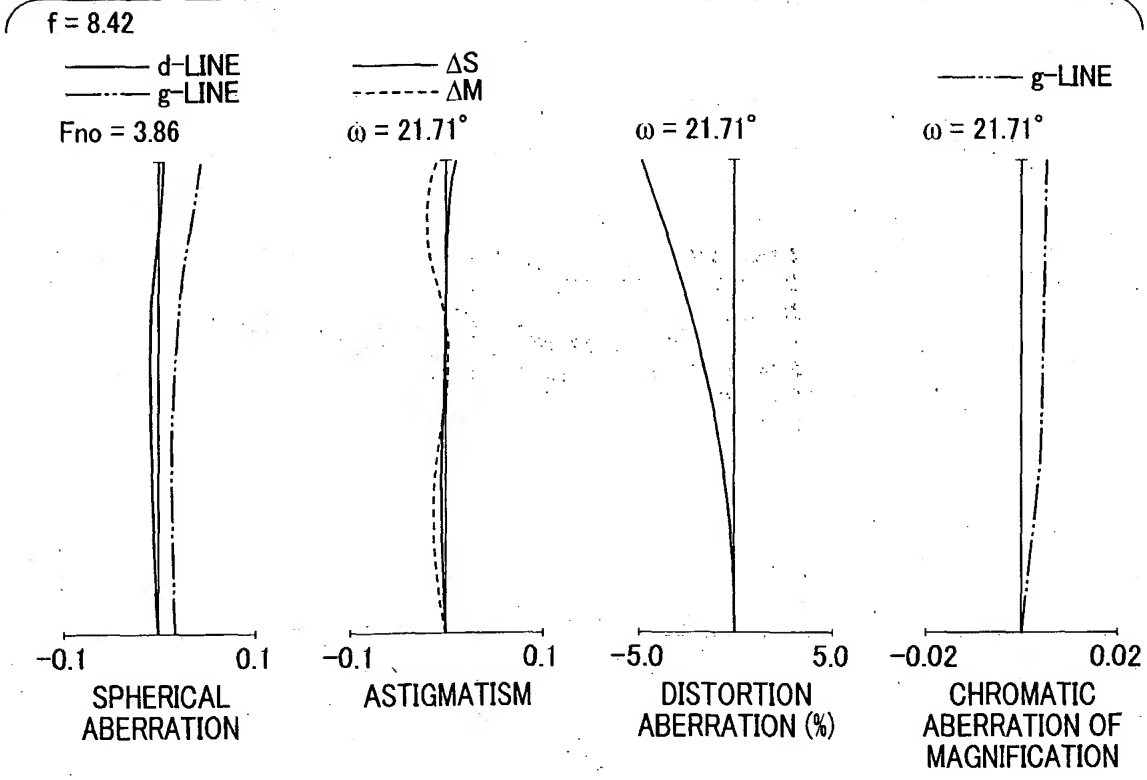

f = 8.42
d-LINE
g-LINE
Fno = 3.86
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 21.71°
−0.1
0.1
ASTIGMATISM
ω = 21.71°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 21.71°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 13A

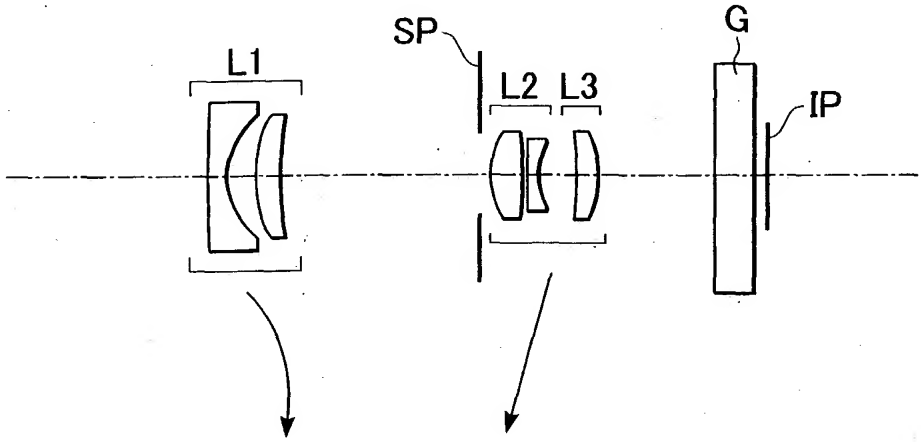


FIG. 13B

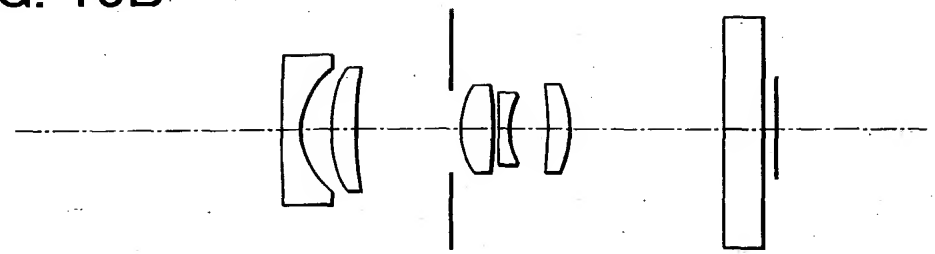


FIG. 13C

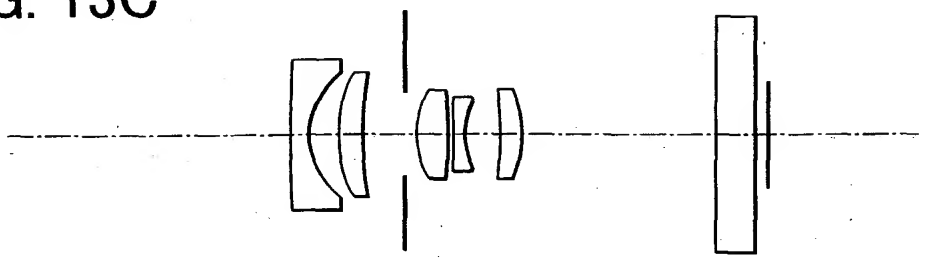


FIG. 14

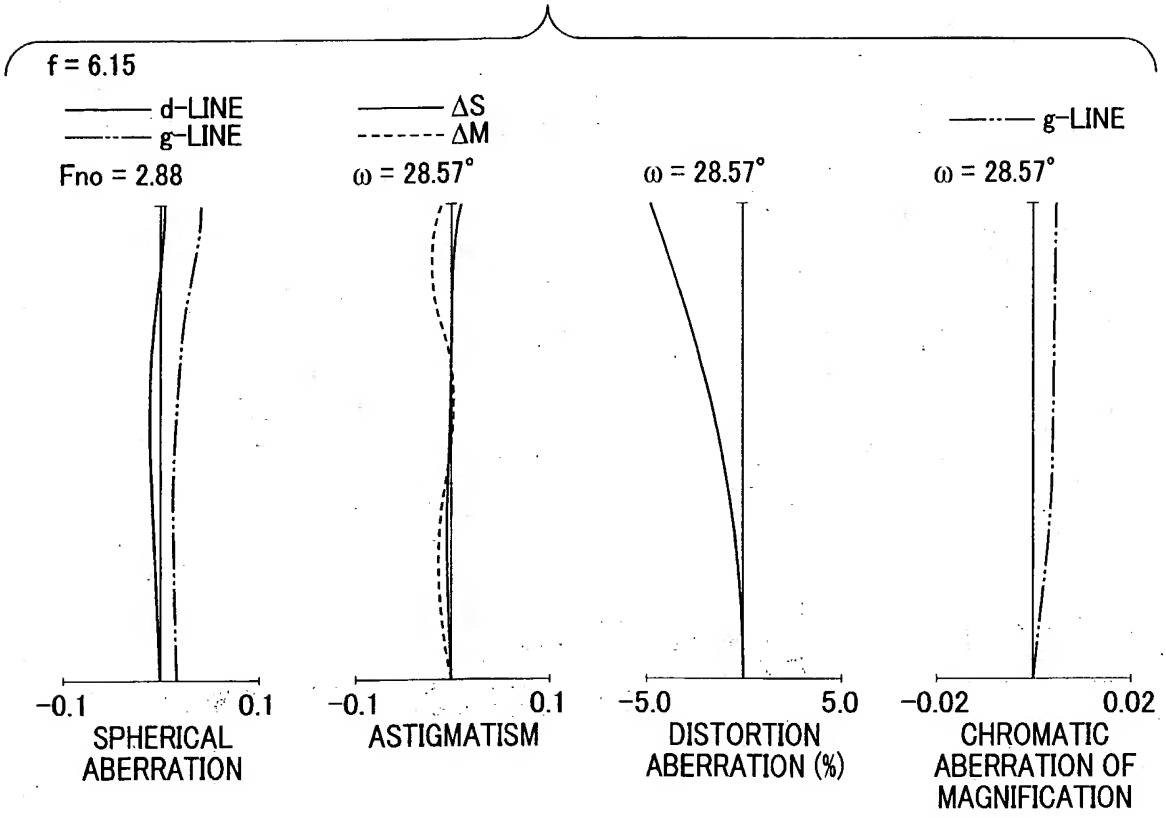

f = 6.15
d-LINE
g-LINE
ΔS
ΔM
g-LINE
Fno = 2.88
ω = 28.57°
ω = 28.57°
ω = 28.57°
−0.1
0.1
SPHERICAL ABERRATION
−0.1
0.1
ASTIGMATISM
−5.0
5.0
DISTORTION ABERRATION (%)
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 15

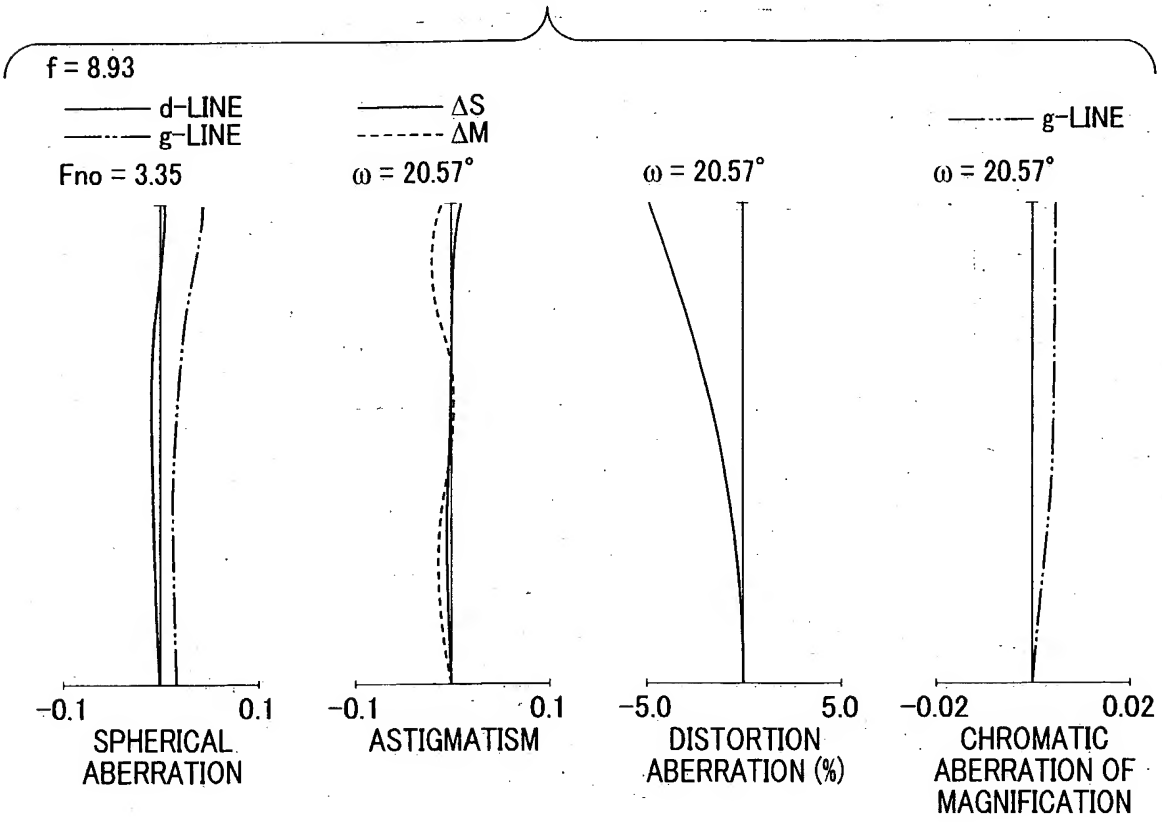
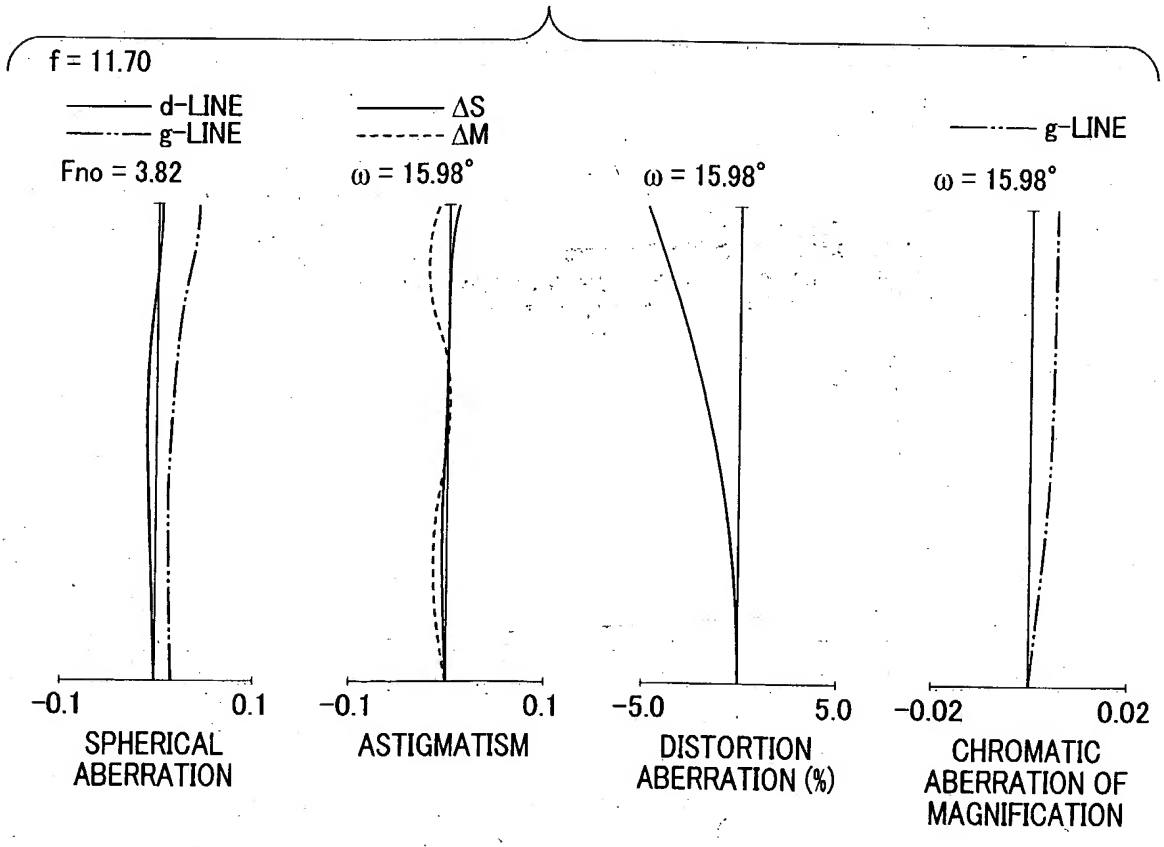

f = 8.93
d-LINE
g-LINE
ΔS
ΔM
g-LINE
Fno = 3.35
ω = 20.57°
ω = 20.57°
ω = 20.57°
−0.1
0.1
SPHERICAL ABERRATION
−0.1
0.1
ASTIGMATISM
−5.0
5.0
DISTORTION ABERRATION (%)
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

FIG. 16


f = 11.70
d-LINE
g-LINE
Fno = 3.82
−0.1
0.1
SPHERICAL ABERRATION
ΔS
ΔM
ω = 15.98°
−0.1
0.1
ASTIGMATISM
ω = 15.98°
−5.0
5.0
DISTORTION ABERRATION (%)
g-LINE
ω = 15.98°
−0.02
0.02
CHROMATIC ABERRATION OF MAGNIFICATION

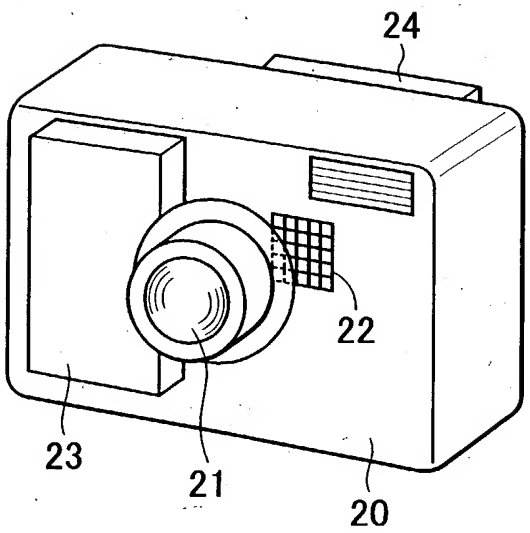



FIG. 17